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Case-6

R&D

Research & Development

BIO-DERIVED MATERIALS

Taking nature to a new level

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What happened to the robot revolution?

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Japan confronts the high-tech challenge

INTERNATIONAL MAGAZINE OF RESEARCH AND DEVELOPMENT

R&D

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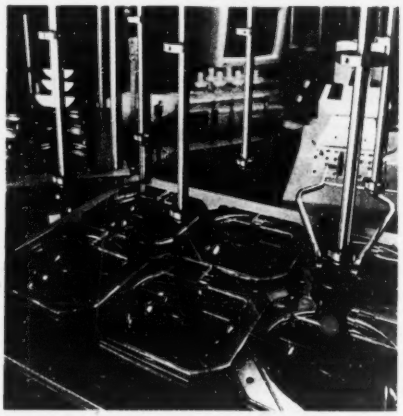

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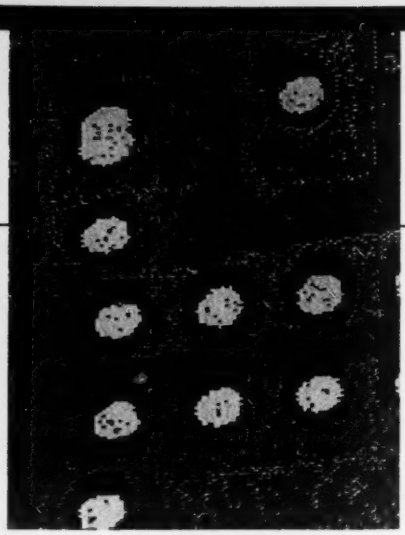

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Joseph Cappello of Protein Polymer Technologies, San Diego, oversees fermentation of bacteria that produce proteins with custom-designed properties. See story on page 58. Photograph by Tim Davis.

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R&D BUSINESS

Japan and Germany cut into U.S. R&D lead

THE GOOD NEWS is that the U.S. still leads the world in "big" R&D categories, such as total money spent, total number of researchers, and volume of high-tech exports, according to a recent National Science Foundation study.

The bad news is that while these totals look great, their rates of change have leveled off or decreased in recent years. The study, *Science & Engineering Indicators–1989,* says that at the same time foreign countries increased their R&D efforts.

The number of Japanese researchers per 10,000 workers in the labor force, for example, exceeds that in the U.S. for the first time. Also, R&D expenditures as a percentage of GNP in Japan and Germany exceeded U.S. expenditures every year since 1984, and each year the difference increases.

The study reveals that, from 1985 to 1989, the U.S. had smaller growth rates in R&D funding and science and engineering personnel than in the 1975 to 1985 period. The U.S. also had a smaller global share of high-tech trade goods, little improvement in school math and science performance, and smaller increases in science and engineering enrollments.

One area that continues to show strong U.S. growth is basic research performed in universities. Basic research in the U.S. has grown 3% annually (in constant dollars) during the past three years, while the development and applied research components of R&D have grown only 1%.

For a copy: NSF stock #038-000-00583-9, price $26; 202/357-7861. □

DuPont to sell thermal analysis unit

TWO DUPONT instrument businesses, the process instrument group and the air and noise monitoring instrument group, have been sold to New York-based Ametek Inc. as part of a restructuring move by DuPont's Polymer Products Dept., Wilmington, DE.

The restructuring is expected to achieve cost reductions of $100 million in 1990.

DuPont's thermal analyzer business also is being sold to a newly formed company led by management and employees of the existing business. Both sales are expected to be finalized by early July.

DuPont has been selling thermal analyzers since the 1960s and is one of the leaders in worldwide sales.

Reports of DuPont's intent to eliminate up to five polymer resins from its current product line as part of this restructuring are "highly speculative," says DuPont spokesman Tom Barry.

The restructuring also will eliminate 900 employees—9% of the polymer department's employment. About 270 of these jobs are salaried positions based in the Wilmington area. □

Molecular spectroscopy to grow 10.7% annually

MOLECULAR spectroscopy instrument sales are forecast to grow nearly 10.7% annually from current annual sales of $1.2 billion to $1.8 billion in 1993, according to Strategic Directions Intl., a Los Angeles-based market research firm.

These instruments include fluorescence, visible, and IR spectrophotometers and FT-NMR, mass spectrometers, and Raman spectrometers. Near-IR spectrophotometers are expected to increase the fastest in this group, at an 18% annual rate.

Most instruments are used in process and product analytical support.

State tech managers must do their homework

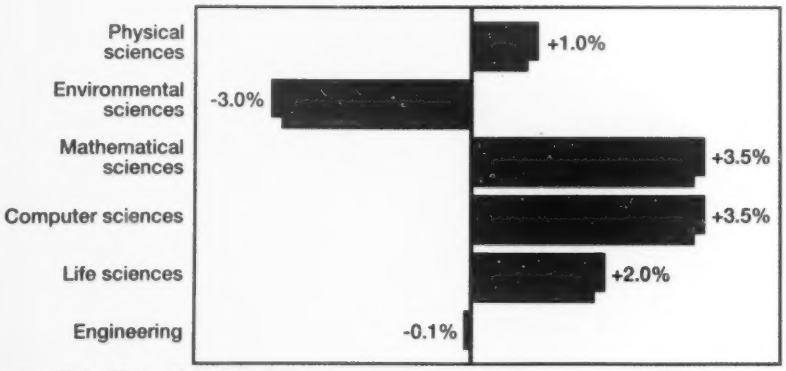
KNOWING THE STRENGTHS and weaknesses of the local economy helps in the success of a state technology program, says David Osborne in his recently completed *State Technology Programs–A Preliminary Analysis of Lessons Learned.*

With this knowledge, a state can establish and update strategic plans that determine how to proceed, says Osborne. Michigan analyzed its manufacturing sector with a strategic audit, then followed up with detailed analyses of the auto industry.

"Few state [programs] are working with industrial groups to improve their competitive edge," says Osborne, an associate at the Council of

Enrollments in graduate science and engineering are slowing

(Percent change, 1987 to 1988)



Source: National Science Foundation

***Although some enrollment** categories increased and others decreased, total enrollment went up 1% from 1987 to 1988—half the rate of increase from 1980 to 1987.*

R&D

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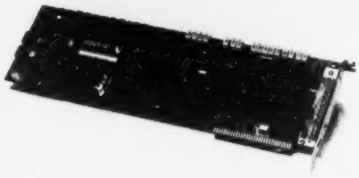

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